A Case-Control Study of Depression as a Risk Factor for Suicide in Military Personnel

LTC Kathryn M. Gaylord, AN
Nurse Researcher
Madigan Army Medical Center
Tacoma, WA 98431
(253) 968-3696

Contributors

- Madigan Army Medical Center
  - Dr. Lori Loan, Nursing Research Service
  - Mr. Troy Patience, Statistician/Mentor, DCI
- University of Pennsylvania
  - Dr. Therese Richmond, Dissertation Chair
  - Dr. Anne Keane, Dissertation Committee
  - Dr. Charles Branas, Dissertation Committee/Statistician

Contributors

- Armed Forces Institute of Pathology (AFIP)
  - MAJ Lisa A. Pearse, MC, USA
- Army Medical Surveillance Activity (AMSA), United States Army Center for Health Promotion and Preventive Medicine (USACHPPM)
  - COL Mark V. Rubertone, MC, USA
  - Lt COL Arness, MC, USAF

Background & Significance Demographics

1.4 million Active Duty Military

1% of working population in U.S.

Active Duty Labor Force

87% between ages 18 to 24

Gender Distribution

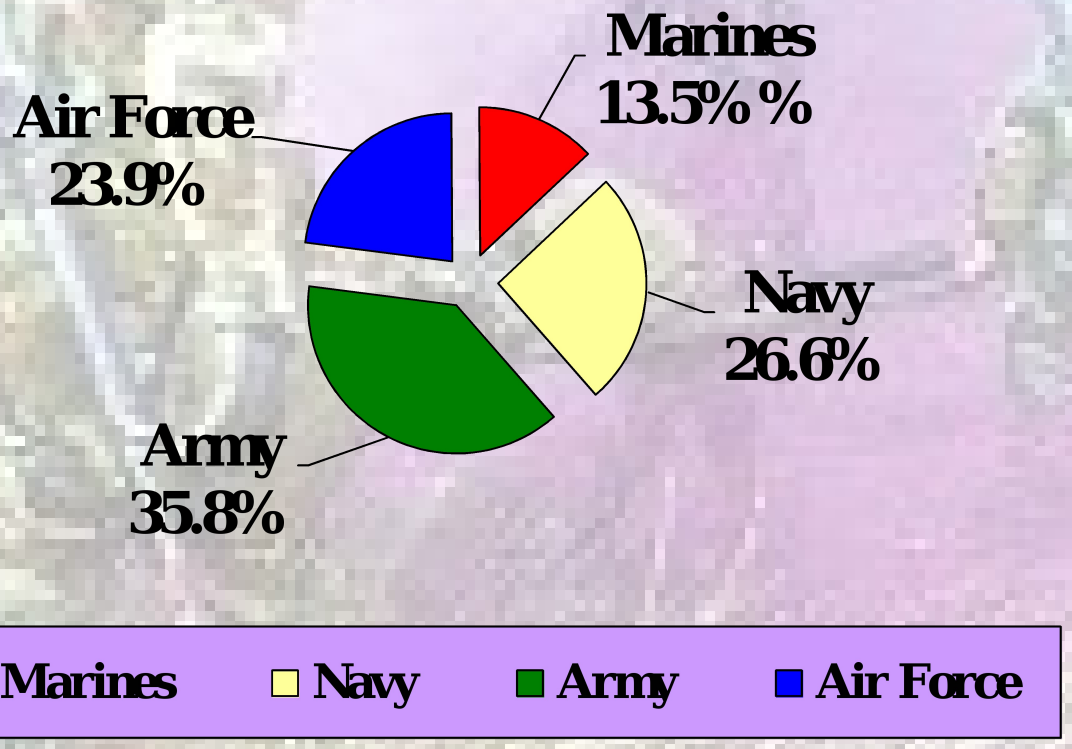
Male 83% Female 17%

Race Distribution

White (66%) Hispanic (10%)

Black (17%) Other (7%)

Background & Significance
Service Demographics



Background & Significance

Historic Suicide Rates

Suicide Rate in U. S. Military

1995-2002 11.9 Suicides/100,000

2003 12.8 Suicides/100,000

Comparison of Suicide in Combat Deployments

Vietnam War

15.6 Suicides/100,000

Persion Gulf War

3.6 Suicides/100,000

Operation Iraqi Freedom

17.3 Suicides/100,000

Background & Significance
Depression Rates

Mental Health Facilities

Outpatient Health Care Encounters 6%
Inpatient Health Care Encounters 4%

Primary Care

Depressive Symptoms	24%
Major Depressive Disorder	8%

Purpose of the Study

To examine the relationship between depression and suicide in military personnel

Research Question:

Do military personnel who are depressed complete suicide more often that military personnel who are not depressed?

Method

- Retrospective, Case-Control Study
- Study Period: Jan 1998 to Dec 2002
- All Service Branches Represented
- Controls:Cases @ 2:1 Ratio (n = 2586)
  - Cases (suicides) from AFIP
  - Controls (live military personnel) from DMSS

Study Sample by Military Service Branch

	Cases		Controls	
	N	(%)	N	(%)
Air Force	166	(19.2)	454	(26.3)
Army	351	(40.7)	576	(33.4)
Navy	218	(25.3)	472	(27.4)
Marine	127	(14.7)	222	(12.9)

Sampling Procedure

- AFIP selected cases (suicides) in study period (n = 862)
- Cases sent to AMSA
  - Controls matched to cases on gender using SSAN
  - Created database of inpatient/outpatient health care encounters
    - International Classification of Diseases, Ninth Revision (ICD-9-CD)
  - Blinded sample
- Examined Primary, Secondary, Tertiary diagnoses for depression

Variables

- Dependent Variable
  - Suicide (Disease Outcome)
- Independent Variables
  - Depression (Main-Exposure Variable)
  - Selected Clinical Variables
  - Socio-Demographic Variables

Socio-Demographic Variables

- Age
- Race
- Ethnicity
- Education
- Marital Status
- Service Branch
- Military Grade
- Military Occupation Group
- Military Years of Service
- Days in Risk Period

Clinical Variables

- Depression
- Alcohol Use/Abuse
- Substance Use/Abuse
- Personality Disorder
- Adjustment Disorder
- PTSD
- Relationship Problems
- Occupational Problems

Definition of Depression (ICD-9-CM) Codes

- 296.2 Major Depressive D/O, Single
- 296.3 Major Depressive D/O, Recurrent
- 296.5 Bipolar Affective D/O, Depressed
- 296.82 Atypical Depressive D/O
- 298.0 Depressive Type Psychosis
- 300.4 Neurotic Depression
- 301.12 Chronic Depressive PD
- 309.0 Brief Depressive Reaction
- 309.1 Prolonged Depressive Reaction
- 311 Depressive D/O, NOS

Definition of Selected Clinical Variables

- 291 Alcohol Psychosis
- 302 Alcohol Dependence Syndrome
- 292 Drug Psychosis
- 304 Drug Dependence
- 305 Non-Dependent Abuse of Drugs
- 301 Personality D/O
- 309 Adjustment D/O
- 309.81 PTSD
- V61 Family Circumstance (Relationships)
- V62 Psychosocial Circumstances (Occupational)

Human Subjects

- IRB Protocols
  - University of Pennsylvania
  - AFIP
- Permission to use Database
  - AFIP
  - AMSA, USACHPPM

Data Analysis

- 2 X 2 Table
- T-test
- Chi square, Wald Chi-Square
- P-values
- Univariate Analysis
- Multivariate Analysis
  - Conditional Logistic Regression

MATCHED PAIR CASE CONTROL STUDY, 2 X 2 TABLE

EXPOSURE (Depression)	**DISEASE (Suicide)** DISEASED	NON-DISEASED	**TOTAL**
EXPOSED	Suicide Depressed a = 145	No Suicide Depressed b = 96	**a + b (n = 241)** Total Number Exposed
NON-EXPOSED	Suicide Not Depressed c = 717	No Suicide Not Depressed d = 1628	**c + d (n = 2345)**
	a + c (n = 862) Total Number Diseased	**b + d (n = 1724)** Total Number Non-Diseased	Total Number Non-Exposed

Relative Risk (RR) = a/(a + b) / c/(c + b) 145/241 / 717/2345 = 1.94 (RR)

Odds Ratio (OR) = ad / bc 145 x 1628 / 96 x 717 = 3.43 (OR)

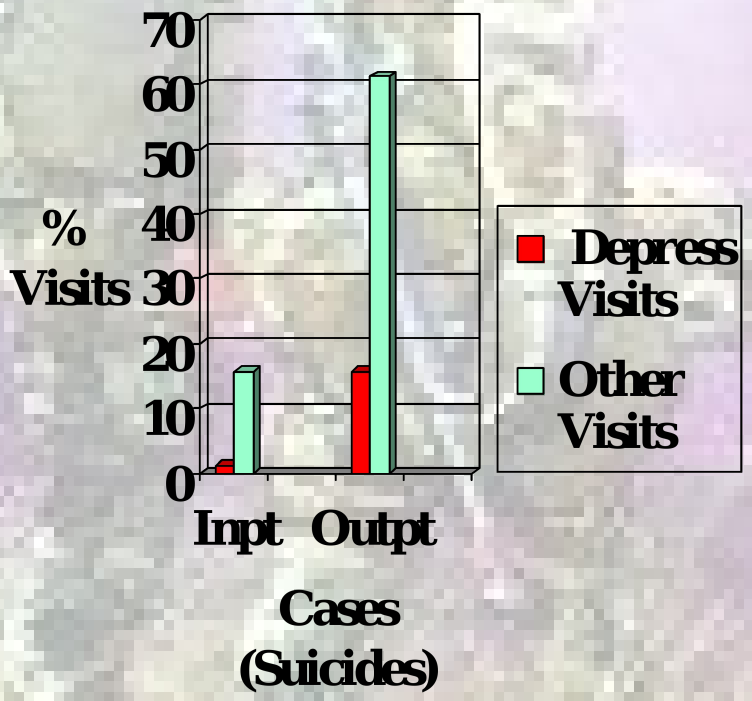
Findings

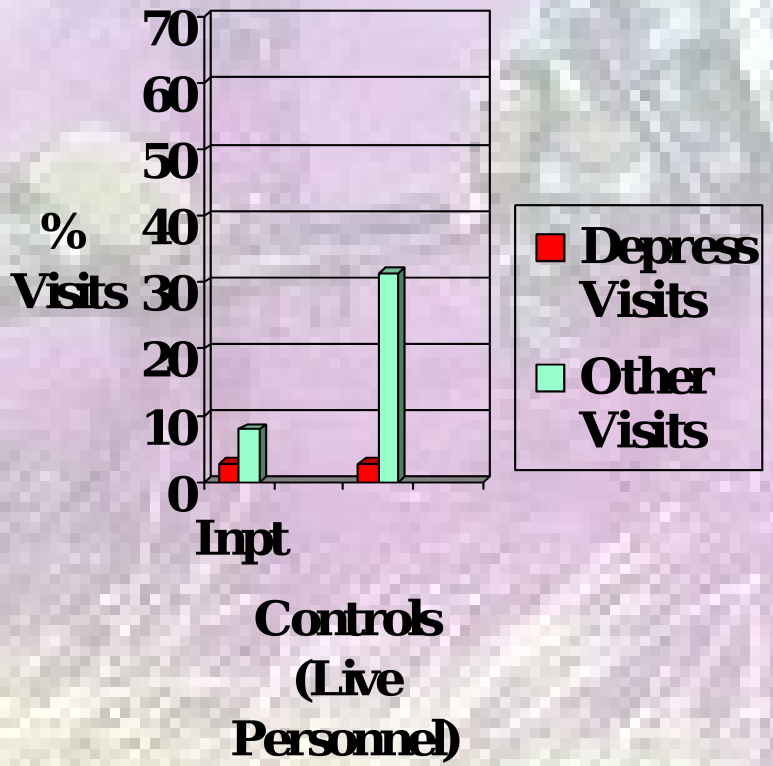
Univariate Analysis

Depression:

The odds of having a health care encounter for depression was estimated to be **3.47** times greater in military personnel who completed suicide than in military personnel who did not complete suicide.

Depression vs. Other Health Care Encounters





Multivariate Analysis

Statistically Significant Demographic Variables

Variable	OR	SD	P < .05	95%CI
Years Svc	0.84	0.0228	0.000	0.79, 0.88
Risk Days	0.99	0.0001	0.000	0.99, 0.99
Age	1.17	0.0276	0.000	1.11, 1.22
White	1.88	0.3155	0.000	1.35, 2.61
Marine				1.25,

Multivariate Analysis
Statistically Significant Clinical Variables

Variable	OR	SD	P < .05	95%CI
Depression	**3.36**	0.7663	0.000	2.15, 5.25
Alcohol	1.03	0.0179	0.043	1.00, 1.07

Comparison of Clinical Diagnoses

CLINICAL DX	CASE %	CONTROL %
Depression	145 (16.82)	96 (5.56)
Alcohol Abuse	57 (6.61)	50 (2.9)
Substance Abuse	106 (12.3)	143 (8.29)
Personality D/O	43 (4.99)	14 (0.14)
Adjustment D/O	89	68

Comorbidity Factors

Variable	Depression N (%)	Alcohol N (%
• Alcohol	33 (31)	
• Substance	63 (25)	72 (29)
• Personality D/O	42 (74)	12 (21)
• Adjustment D/O	89 (57)	31 (20)
• PTSD	7 (100)	7 (100)
• Relationship	60 (33)	26 (14)
• Occupational	80 (40)	31 (20)

Discussion

- Case-control study confirms the association of depression and suicide
- Co-morbidity with selected psychiatric clinical diagnoses increases the risk of suicide

Discussion

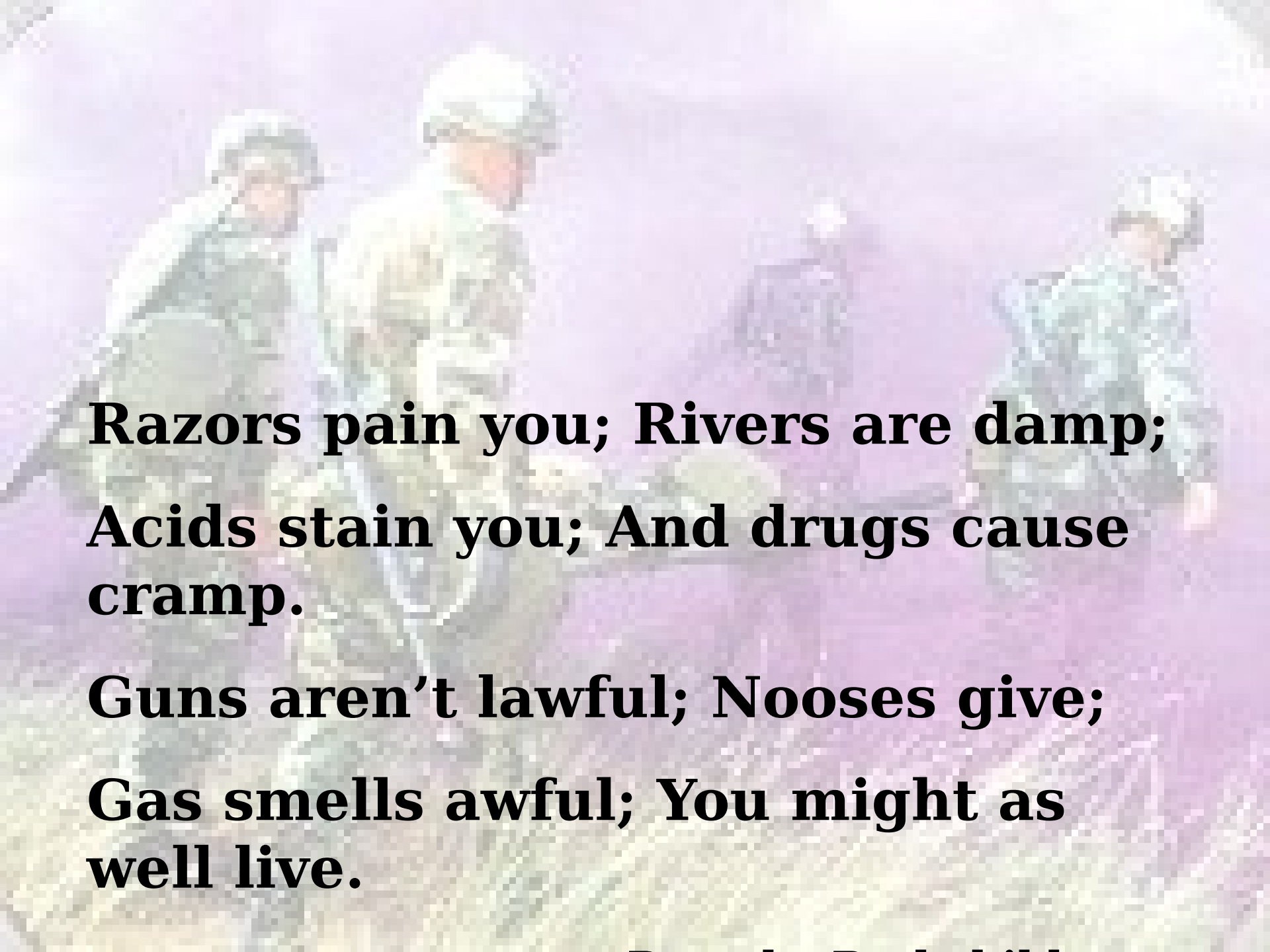
- Only the “tip of the iceberg”
  - Continued stigma related to receiving MH care
  - Depression is undiagnosed and untreated in Primary Care
  - Increased deployments impact Mental Wellness

Military Nursing Implications

- All military at risk
- Recognition and acceptance of depression
- Nursing Research
  - Primary Care
    - Holistic Nursing
  - Mental Health Units
  - Combat Stress Teams

Recommendations

- Further examine the impact of depression in military personnel
  - Attrition Rates
  - Stigma related to receiving MH care
- Increase training related to depression for Primary Care Practitioners
- Evaluate compliance with DoD Depression Guidelines
- Increase Mental Health Teams in Combat



Razors pain you; Rivers are damp;

Acids stain you; And drugs cause cramp.

Guns aren’t lawful; Nooses give;

Gas smells awful; You might as well live.

Questions?